IOWA CONSERVATIONIST

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CHEMICAL CONTROLS VS. WILDLIFE

A DISSERTATION ON *TERRESTRIS LUMBRICUS*

By John Madson
Education Assistant

There was an old story which was guaranteed to get results from the ladies, if no one else. Seems a fellow met a small boy and asked "Boy, where are you going?" "Fishin'." "What you got in your mouth, boy?" "Fishworms." Which isn't much of a joke, we'll admit, but it gets us into the subject at hand.

Fishworms, nightcrawlers, angleworms, garden hackles, or whatever, they are known to all, fishermen or not. They are held in high regard by small boys, robins, bullheads and gardeners. They are frowned upon by ladies, little girls, and dry fly enthusiasts. But, loathed or admired, they are not only a vital part of our soil but also a particularly good fish bait.

We have several species in this country, the largest being the common nightcrawler which may reach twelve inches in length. This is by no means a size record. A species in Australia may exceed ten feet, being as big around as a man's thumb.

As any fisherman knows, hunting nightcrawlers may be half the game, while the actual fishing trip may only be an anticlimax. A warm, wet, summer night, a good flashlight and one of the boys to carry the bucket is all you need. Personal identification might help. Some people are chary of strangers creeping stealthily through the shrubbery with flashlights. But then, some people don't fish.

It probably isn't your flashlight that scares the big worms. While sensitive to light, it seems to be the attendant heat and drying action that they really fear. They are, however, extremely sensitive to vibrations in the earth. A heavy footfall is all the warning they need. This alertness, plus speed, slipperiness, and the ability to hold to the burrow by means of the bristles, or setae, may give the greenhorn some trouble.

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Herb Swartz Photo.

One question that has given conservationists great concern is, will widespread use of chemical sprays for insect control destroy bird life by killing insects upon which the birds must feed?

SOIL CONSERVATION DISTRICT DEVELOPMENT

The week of June 15-21, 1952, was proclaimed by Governor Wm. S. Beardsley as "Soil Conservation Week," with special emphasis placed on the importance of a local Soil Conservation District. A few years ago the members of Congress passed a law making the establishment of soil conservation districts possible and at the same time setting out some of the policies by which soil districts would function.

In 1939 the Iowa Forty-ninth General Assembly passed the "Soil Conservation Districts Law." This law made it possible for Iowa farmers to organize, establish and operate local soil conservation districts in the interest of need, health, safety and public welfare.

Each district had to be established according to the state law, which required that at least 20 per cent of the landowners within the boundaries of the proposed district must sign a petition asking for the formation of a soil conservation district. The necessary hearings, referenda and elections have now been held and 100 Soil Conservation Districts have been established in the state, covering all the land in Iowa, exclusive of cities and towns.

Iowa was the first state in the area of Region III of the Federal Soil Conservation Service and the tenth state in the nation to be 100 per cent organized. This feat in itself speaks very well for the farmers of the state and helps to prove that Iowa farmers are well aware of their soil problems and how they can best solve them. The State Soil Conservation Committee recognized this accomplishment by holding a Soil Conservation District recognition program at Ames on February 14, 1952.

Robert M. Salter, Chief of the United States Soil Conservation Service, told the group at Ames, "You are now organized to do the job of soil conservation in Iowa but your work has only begun. Here in America and under the Soil Conservation District setup, the first and one of the most important steps in conservation is to organize for the job ahead."

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By Clarence Cottam
Assistant Director
U. S. Fish and Wildlife Service

EDITOR'S NOTE: Much has been written about herbicides, insecticides and other poisons in the past few years since DDT and the other "miracle" compounds made their appearance on the scene. Much of what has been written is violently partisan, either "viewing with alarm", or heatedly defending this "boon to the farmer." Dr. Clarence Cottam, Assistant Director of the United States Fish and Wildlife Service, has presented as complete a report on the current situation as we have been privileged to see. We heartily recommend Dr. Cottam's article to all our readers.—*North Dakota Outdoors.*

Generally, each step forward in economic progress involves a step backward for certain other values. Each advance brings incidental losses, some of which cannot readily be reckoned in dollars and cents. For example, about 1,000 deer are killed by autos every year in Michigan alone. Such losses are impressive but not sufficient to induce a return to the less destructive horse and buggy. Nor is the public so impressed with the heavy penalties paid for agricultural expansion in America that the West is likely to be restored to its original occupants—the bison and the Indians. Instead, we philosophize that progress takes its toll.

Chemicals useful in controlling man's pests belong in this category of mixed blessings. They clearly manifest potentialities for harm as well as for good. Yet, like the auto, their economic value is so great that there can be no doubt that pesticides are here to stay even though some control agents may be replaced. Also, there can be little doubt that some of the unnecessary losses they inflict upon wildlife will continue until greater knowledge and better methods of application are developed. The task at hand is to fit pest control agents wisely into the wildlife picture—or vice versa.

New Field

The mushrooming new field of chemical controls resembles a rapidly growing child outfitted with clothes much too small for it. Since World War II, production

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HOT WEATHER FISHING MENU

Just as you lose some of your zip during hot weather, so do the fish. And, just as you, the fish must eat despite a jaded appetite, in order to exist. It is up to you to be there when the fish decides to eat.

First, don't keep switching from one lake or stream to another. Pick out one or two old standbys and stay with them. It is better to know two lakes extremely well than to know 20 lakes remotely.

The most logical times to catch bass during hot weather are near sunrise and sunset, or usually sometime between 10 p.m. and 2 a.m. By fishing at these times and concentrating on one or two lakes you will learn the approximate feeding hours and the best feeding spots.

Once you have determined the times and places, you're down to the all-important question, "What will I offer them?" This is as basic as dill pickle on a ham sandwich, and here is the suggested menu.

When the water is calm, give them a topwater lure like the Chugger or Crazy Crawler, but work it slowly, lazily and teasingly. You've got to convince them it's an easy meal like some small creature that's injured and can't get away.

Use these same tactics after dark BUT wait almost twice as long before retrieving your lure. Since game fish can't see as well after dark, just like you, they come searching for it where they heard it fall.

When you move your lure, don't scare their scales off; do it gently, tantalizingly. Make them want to smash it before it musters enough strength to swim away.

If they don't want it on top, try a Floating River Runt or Meadow Mouse which will come through shallow cover. If no luck, then go deeper with a sinking River Runt, Punkinseed or Go-Deeper River Runt.

As a "last resorter" here's a honey, unless you have an aversion to live bait. Attach a small, live frog to a Stanley Weedless hook, No. 6, with weight attached, and troll slowly while it bumps the bottoms of the deeper holes. And keep alert because the viciousness of the strikes will amaze you!

To sum it up, fish the best holes at the proven times with the baits that have earned your confidence. Thus, you will gain both fish and confidence in yourself. When you've done this, you're a fisherman!—*Heddon Fish Flashes.*

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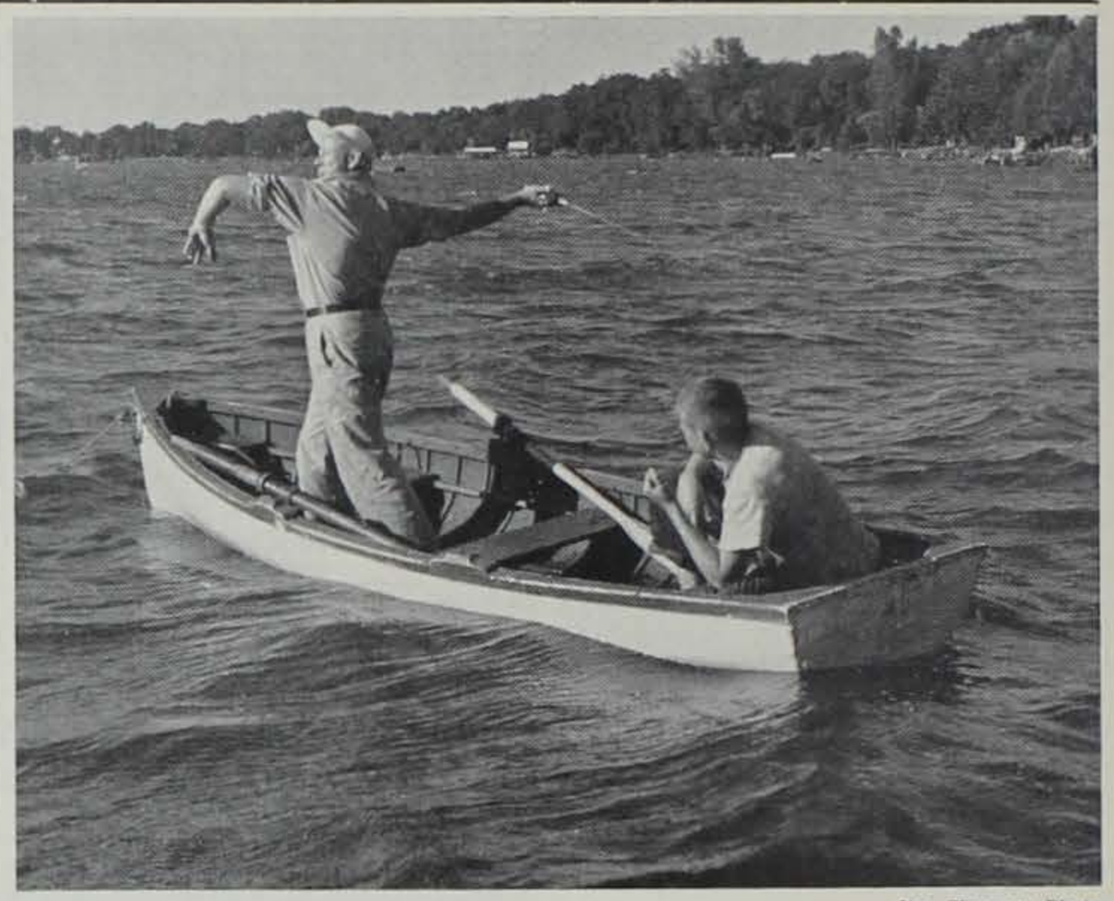
The herring gull is a fresh clam addict. However, since he can't pry open the heavy armour of this shell fish with his beak, he simply takes the whole thing up in the air about 30 feet or so and drops it on rocks, or better yet on concrete pavement, and smashes it open. B.C.

Jim Sherman Photo.
"Fish the best holes at the proven times with baits that have earned your confidence and you will gain both fish and confidence in yourself."



Jim Sherman Photo.
The cane pole and bobber fisherman says the plugger throws his missiles in a 25-yard circle around his boats and acts like he owns the place.

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HOW ARE YOUR FISHING MANNERS?

Fishing seasons and fishermen being what they are — wonderful things and mostly fine people — much deep thought is being given to this year's onslaught against those knucklebusters that got away last season.

All such thoughts come quite naturally to most anglers but one thought comes too infrequently to many — streamside and lakeside courtesy, according to letters received by Heddon's research department.

Take the cane pole and bobber fisherman, for instance. He complains that the guy throwing plugs around tries to hog half the lake. Says the plugger throws his missiles in a 25-yard circle around his boat and gets riled if anyone approaches him; acts like he owns the place!

The plugger writes to gripe about the cane pole fisherman who rows right along the shore line where he (the plugger) is casting. Declares the cane pole man could have rowed behind him and not loused up his fishing, the thoughtless so-and-so.

And the fly fisherman blows a gasket over the guy who comes plodding down stream behind him, waddles up to where he (the fly fisherman) is wooing a nice one, and barks, "Say, got any spare nightcrawlers?" Then, when informed the fly fisherman is using flies, looks down his nose at him and he (the worm fisherman) proceeds to waddle right on through the hole, like a moose on water skiis!

Others have kindred gripes, such as the aquatic "Hot Rod Harry" who roars around the lake in his speedster, seeing how close he can come to folks fishing in boats; likes to make them bob like big corks.

And there's the big-hearted fellow who insists on doing the honors at the oars, then proceeds to cast ahead of the boat, fouling up the fishing for his companion in the bow.

Also singled out is the fancy fly fisherman who drops the anchor amidst a quiet gathering of still-fisherman, stands up so all can see his majestic figure and displays his prowess at laying a long line—while everybody around ducks his sagging back cast.

One little thought, suggests Heddon, would eliminate all this confusion and complaint. It's old and golden, "Treat other fisherman as you would have them treat you."—*Heddon's Fish Flashes.*

LOVE IT OR LEAVE IT

Jerry Jauron said last week that to be a conservation officer you worked 364 days of the year . . . that only those men who "love and have their heart in the work" can or do stay in such day and night work. The Conservation Commission and officers are striving to work towards greater outdoor activity for all the people. And, he adds, being such an officer is different in that 90 per cent of their cases meant they had to catch lawbreakers actually "in the act" of violating the state game and fish laws. This requires, quite often, considerable finesse and patience.

It is easy to see that a game warden has to really "love" his work to undergo all the inconveniences of the position, for it is no secret that other jobs pay more money for considerably less effort. Which brings up the point—what peace, what advancement this old world would know if every man was placed in just the right niche —employed in a job that he loved. When you like your work, you never tire of it and it ceases to become work. That's the type of men game wardens are.—*Harlan Tribune.*

Jim Sherman Photo.
Hares and grouse in the north-central region reach peak populations in years ending in ones and twos; so mostly has the introduced ringneck pheasants.

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THE MATHEMATICAL MUSKRAT

Part II

By Paul L. Errington
Iowa Cooperative Wildlife Research Unit
Iowa State College

The 10-Year Game Cycle

Our own emphasis in the cooperative Iowa studies has been placed upon trying to study in detail what happens during drought crises, die-offs, and "cyclic lows," to look for *population symptoms* that might line up, *even* at times of no pronounced changes in numbers of animals living on the study areas.

Briefly, the indications are that populations of certain species, such as the snowshoe hares and ruffed grouse of northern backwoods and wildernesses, have a tendency to rise and fall with a rhythm of about ten years. Since the beginning of the century, these hares and grouse have, in our north-central region, reached peak populations in or about the years ending in ones and twos and declined to low levels by the years ending in sixes or sevens. So, mostly, did the introduced rinkneck pheasants after their establishment in the northern corn belt.

Partly because of their being push-overs for drought emergencies, our muskrats haven't always followed the same schedule of ups and downs as the hares, grouse, and pheasants. Still, the muskrats have shown in other ways what certainly look like symptoms of the "ten-year game cycle."

The year-to-year changes in average sizes of muskrat litters did not have any effect that I can see on the population levels of the Iowa study areas. The lining up of the years of large, small and intermediate sizes of muskrat litters with the corresponding high, low, and intermediate years of the hare, grouse, and pheasant populations of the region nevertheless would not appear to be merely coincidental. They must reflect something in common. Likewise, all of the evidence we have as to young female muskrats themselves giving birth to young in the year of their birth came only from the favorable periods of the "ten-year game cycle."

Social Tension

In behavior, the muskrats have shown differences that also have lined up with the ups and downs of the hares, grouse, and pheasants. During the favorable years for the latter species, Iowa muskrats as a rule displayed less social tension during and after the breeding season than they did during the "cyclic lows." Their teeth were undoubtedly as able to expose a hip joint or bite through the face of one of their offending fellows in one year as in another, but, during the "cyclic lows," they were more disposed to interpret neighborliness uncharitably and to insist upon having their own way when they wanted it and to pull out and leave the old homestead if it didn't suit them in every particular. In late summer, 1646, our central Iowa muskrats were very restless, engaging in a tremendous amount of cross-country movement into strange and dangerous places, though the marshes and streams were, by human standards, in good condition for muskrats and not overcrowded.

Another lead as to what may go on during different stages of the "ten-year game cycle" is provided by changes in resistance of muskrats to what can be an outstandingly ferocious disease. Our pokings around among the spotted livers and inflamed insides of thousands of infected muskrats permit several classifications. At times of the "cyclic lows" of the hares, grouse, and pheasants, muskrat victims generally showed signs of low resistance to this disease, compared with high resistance at times of "cyclic highs" and intermediate degrees of resistance at intermediate periods. In 1951, with the approach of a new "cyclic high," few animals were dying from the disease on our study areas, but great numbers were contacting it and recovering—except at Little Wall Lake, where the prevailing form was a fatal pneumonia, to which the animals seem unblessed with resistance at any time, whatever the "cyclic" stage.

Depressive Factor

The over-all picture that is currently shaping up from the "cyclic" manifestations suggests the influence of a depressive factor the intensity of which changes at fairly regular intervals. It is far from being the only thing capable of depressing life processes and populations, and it obviously does not affect all kinds of life equally, but there does seem to be a timing of symptoms that applies rather uniformly at least over our region.

I admit that I don't know what master force could operate on any such timetable. Many possible explanations—among them, variations in ultra-violet light coming through the atmosphere — have been offered.

Surely there *is* an unsolved mystery in the "ten-year game cycle," and many of us feel that it is one of the most challenging in both conservation and biology. Some day, someone may run this down and find out how it works, not just as a factor in the lives of muskrats, or of pheasants, or of any species in particular. It is a part of life, something we live with.—The End.

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Jim Sherman Photo.
During favorable years for hares, grouse, and pheasants, Iowa muskrats have displayed less social tension than they did during the "cyclic lows."

FINS, FURS AND FEATHERS

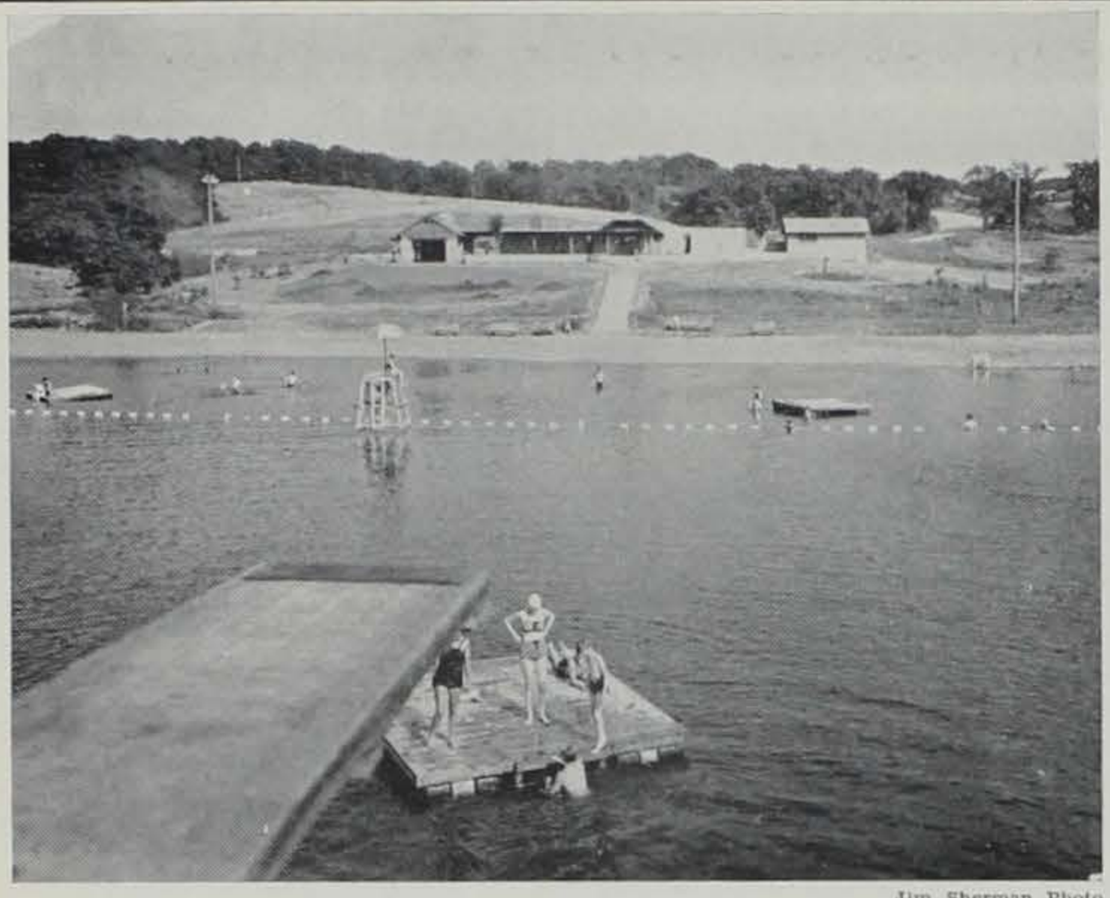
In that little pool below the Hopkinton Dam are a good many really big catfish. My guess is that some of them will go around 30 pounds. Occasionally a fisherman ties onto one of these—and the result is a busted line. Wish some really good catfisherman would demonstrate how to land one or more of these mammoth fish.

Here's the telling of a deep, dark secret, in part. In a certain spring-fed short creek in Delaware County have been stocked something like 300 big, mature trout. The whole thing is an experiment. Some day one, or more, unsuspecting fisherman is going to stumble on this stretch of water and get the surprise of his or her life. I know there are trout in this water that will go seven pounds. I've told you all but the where—therein will be the thrill of discovery.

If you're high-brow in your fishing desires you will not be interested in carp, but if you are the average, ordinary human creature you will get just as big a bang out of hooking and landing a 10-pound carp as you would a like-weight catfish. The carp season is here right now. With the right dough bait, plenty of line and stout tackle you can have real sport in angling for carp. Don't let anybody kid you; if you can land a 10-pound carp you qualify as a bonafide fisherman.

From now on you'll get excellent results using medium-size crawfish for bait. Don't use black crawfish —they're not so good. But the yellow specimens, either hard or softshells, are good for all game fish. Crawfish are easy to get and they stay good far longer than minnows. Get wise — use more crawfish. Bass, catfish, trout, walleyes and even carp love them.

Wish I'd had a pistol the other day. Hooked a huge hardshell turtle—a monster. Couldn't land it. Bet there was five pounds of meat on that creature. Turtle meat is delicious.—*Manchester Democrat-Radio.*



Jim Sherman Photo.
The outstanding feature at Ahquabi State Park is the lake. This and other lakes of southern Iowa are partly man-made.

AHQUABI—MAN MADE PLAYGROUND

By Charles S. Gwynne
Associate Professor
Department of Geology,
Iowa State College

The outstanding feature at Ahquabi Lake State Park is, of course, the lake. Like the other lakes of southern Iowa this one is in part man-made. Notice that we said "in part." Man may be said to have made the lake, or at least the lake basin, when he placed a dam across a small tributary of Squaw Creek. But there had to be a depression, a valley, in the first place. And that was made by the rain which fell in the watershed of the area, and flowed toward Squaw Creek. It had taken nature many thousands of years to bring the valley up to its present size. Then all man had to do was to place a barrier across the flow of water down the valley, and presto! He had a lake, or at least a lake basin! Given enough rainfall and then, of course—he had a lake.

The park is an area of about a square mile in southern Warren County, only a few miles south of Indianola. The lake has two arms, an east arm and a south arm. These two arms were converging valleys before the lake waters flooded the area. The south valley was the larger of the two, and now is the longest arm of the lake. It is over a mile from the dam to the south end of the lake. Beyond that there is still over two miles of valley farther south.

The park is in the area of what the geologists call the Kansas drift. The Kansan, named from its deposits having been recognized in Kansas, was the second glacier to invade Iowa and surrounding states. Of course, this glacier, like other glaciers of the Ice Age, came from Canada. Eastern Kansas was about as far as it got in that direction. The drift, the deposit left when the glacier melted away, was like the drift of other glaciers, a jumbled mass of clay, silt, and sand, with pebbles and larger rocks.

The surface of the drift, as it first appeared when the ice left, is thought to have been plain, much like most of northern Iowa. That was at least a few hundred thousand years ago. Since then most of the plain has been carved up into hills and valleys by the running water. This explains the slopes in the park.

The area has also been mantled by loess, the windblown silt, derived from the barren drift surfaces and from the bottomlands of larger rivers. The larger boulders of the drift, so often found on the surface in northern Iowa, are almost absent here. That is partly because the loess has covered up the drift. Such glacial rocks are even scarce in the gulleys of the area. The gulleys have cut through the loess but not very far into the underlying drift.

Beneath the subsoil of glacial drift and loess is a deposit of sandstone and shale. Most of the rock used in the park buildings came from this sandstone. The quarry is on the west side of the lake near the south end, but the rock does not outcrop elsewhere in the park. It is seen to be a massive rock, lacking the bedded characteristic of most limestone. On top of it there is a deposit of crumbly, sandy shale. All of this material was deposited as a sediment in a tidal river or even in the sea, in remote geological times.

The rock is brown because of the iron-containing mineral limonite. This helps to hold the grains of sand together. There is also abundant glistening mica, in the form of tiny flakes. The rock is so weakly cemented that it can be easily quarried and shaped into blocks. It is not, however, very lasting. In the buildings it is already beginning to show the effects of weather. However, it still bears the marks of the chisel used in shaping the blocks.

There are also some limestone blocks in the shelter house by the beach. Some of these came from quarries at Anamosa. They may be recognized by their light color and delicate banding. Some of the blocks in the terrace wall are of another kind of limestone. These contain many fossils, the imprints of the animal life which lived in the sea at the time when the material of the limestone was being deposited as a sediment.

Changes have taken place in the area since the dam was built in 1935. Deltas have formed at the upper end of each of the arms. The south arm has thus been shortened almost one-quarter of a mile. These deltas are made from the sediment carried in by incoming streams.

The lake shores are being eroded by the waves. This is noticeable in places where the shores are steep, and wave action severe. Landslides occur in the loose drift and loess when the bank becomes over-steepened. Thus, the lake area is slowly being enlarged by this process. At the same time the sediment eroded from the shores is making the lake shallow.

The pebbles of the beach are of many different kinds. They are of the same sort as those found in the glacial drift. The gravel and sand of the beach were brought in from some nearby gravel pit, where they had been deposited by glacial melt-water, or by a post-glacial river.

Thus, the park area bears the record of events long since passed. Seas, glaciers, wind and running water have played their part in making the area what it is today. And finally man found this restful site and improved it for his use.

Jim Sherman Photo.
The pebbles on the beach at Ahquabi are of many different kinds and were brought from a nearby gravel pit where they had been deposited by glacial melt-water and post-glacial streams.

Kurly Kinks

By Curly Sharp

Most fishermen use hooks that are too darn big when fishin' for sunfish or bluegills. Small hooks, small baits, small leaders, small sinkers, are the secret of getting more cooperation from the pesky sunfish, and remember they are tops in good eatin'. Number 8 hooks are the largest hooks you should use and 10's and 12's are even better. They don't tear or spoil the natural looks of your bait and all worms wiggle better on 'em.

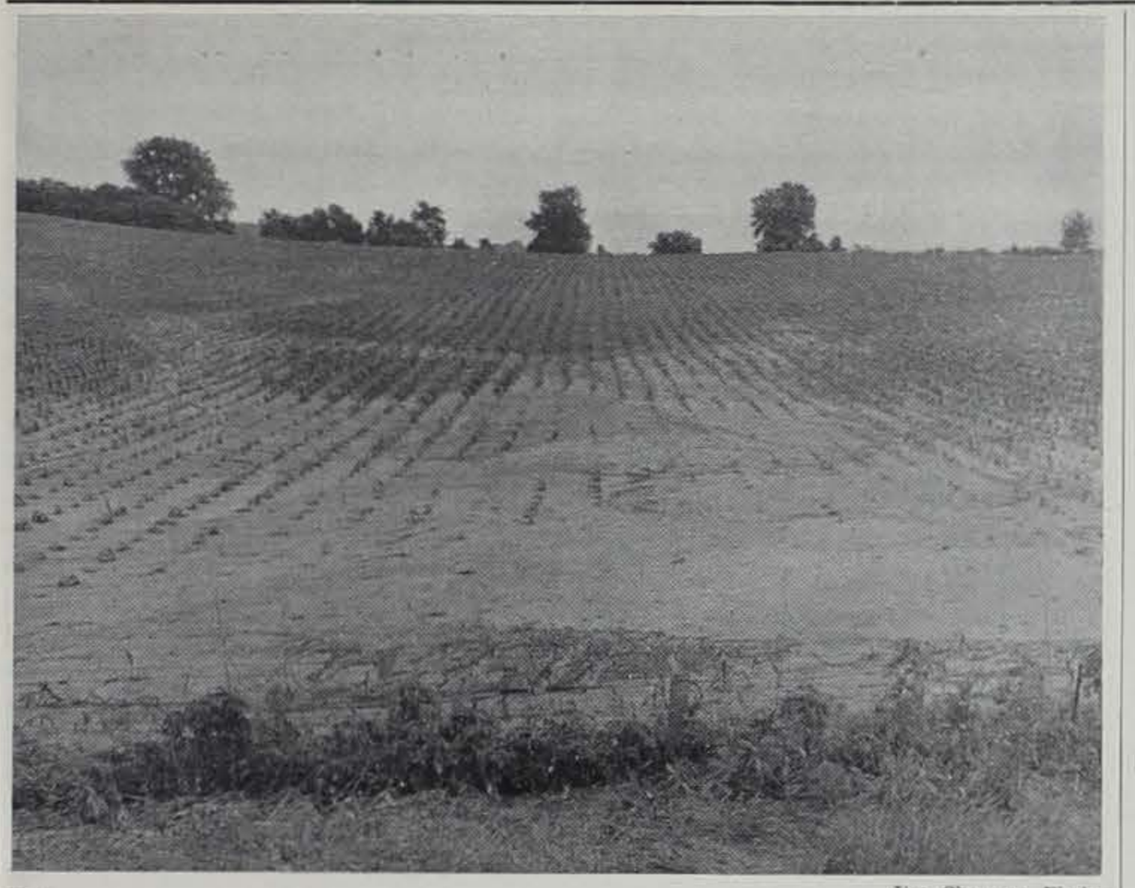
The smaller the leader, the better, and the less the fish is alarmed. A 4-pound test nylon will get you more bites — more fish. If you don't have a good hook disgorger, don't try to tear out the hook if the fish swallows it. Cut off the leader at the lip and tie on a new hook. Extract the hook later when you dress your fish. You save time and trouble and the fish look and keep better not being all torn up.

One split shot is usually all you'll need and tiny sinkers don't alarm fish. The only occasion for heavier sinkers is when you are fishing in the current of a stream or when your boat swings around in a brisk wind.

A small float is almost a must and there are several good ones available, or a small cork is just as good. With your knife put a deep cut in one side, pull line into cut and put a small piece of match stick in cut to keep line from getting out of slit.

Use a small lively angleworm on a short shank Eagle Claw hook. Remember, no larger than No. 8. You can get these "Bait-Holder" hooks with the tiny barbs to keep worms from slipping off. Small lively worms are better for bluegills than the big worms and better than nightcrawlers.

When they won't hit worms, try some of these top baits. Corn ear worms, cockroaches, corn borers, bee grubs, and crickets. When you hit a good spot don't lose it. Carry a sealed bottle with 20 or 30 feet of line wound around it and a heavy sinker at the other end of line, throw it overboard when the fish start bitin' and if you drift away you can go back and find your lucky spot.



Jim Sherman Photo.
Soil conservation is said to be everybody' business, not just the farmer living on the land and this is surely true here in Iowa.

Development . . .

(Continued from page 49)

The last position of this one-hundred soil district team has been filled and with this large team pulling in the same direction, the state of Iowa, through its people, should really put soil conservation on the move. The Soil Conservation District Commissioners of Iowa, as set forth in the State Soil Conservation District Law, are charged with the responsibility of coordinating and guiding the soil conservation activities in their respective districts. Soil conservation is said to be everybody's business, not just the farmer living on the land, and this is surely true here in an agricultural area such as Iowa.

One may ask, "Well, how can I fit into this soil conservation program?" There are ways whereby most all groups and individuals may help, even though they may live and work in a town or city in Iowa. One can assist the program by becoming acquainted with it and telling others what the district can do for them and the welfare of the county. There is a local Soil Conservation District in each county of the state, with offices in the county seat towns in most cases. These offices are set up to serve the District and to act as a clearing house for the various soil conservation activities.

Soil conservation must be considered generally in three phases, the education phase, the technical phase and the application phase. These three phases of the program are being stressed by different agencies but must go hand in hand for maximum application. The three specific agencies and their phases are: the Extension Service, Educational phase; Soil Conservation Service, Technical phase, and the Agricultural Conservation Program of the Production and Marketing Administration, the Appli-

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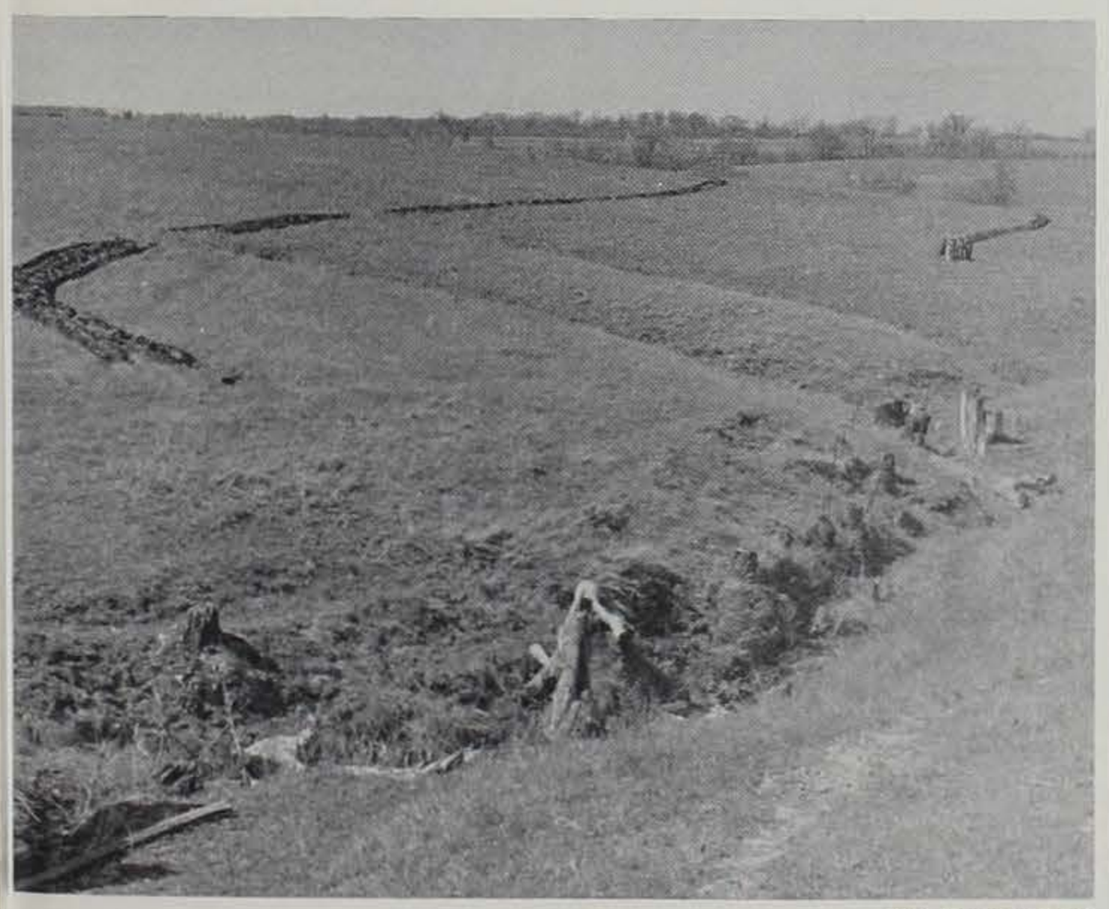

Jim Sherman Photo.
Most everyone will admit that a lot of soil conservation practices have been applied to the land the last ten or twelve years but the program must be speeded up.

USE COMMON SENSE AFLOAT

Courtesy of Outboard Boating Club of America

KNOW YOUR BOAT

Every boat has its limitations. Learn what you can expect from your boat.

WATCH THE WEATHER

Head for shore before a storm breaks. If caught out, seat passengers on floor.

DON'T OVERLOAD

Seats do not indicate capacity. Two or three adults may be a full load under many conditions.

HEAD *INTO* THE WAVES

If waves are high, head your boat at an angle towards the waves at slow speed.

BALANCE YOUR LOAD

Distribute weight evenly in the boat—from side to side and from bow to stern.

USE THE RIGHT MOTOR

Too much power can damage your boat—may even swamp it. Look for OBC recommended horsepower plate.

KEEP LOW

And step in the center when boarding the boat or changing seats.

AVOID SHARP TURNS

Fast, sharp turns are hard on equipment—and sometimes on people. Take it easy.

DDT, even in astronomical dilutions, is deadly to fish life and remains lethal in water for long periods.

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Chemical Controls . . .

(Continued from page 49)

and use of miracle compounds to control insects and other pests have increased so rapidly that reliable know-how or avoidance of harm to wildlife hasn't been able to keep pace. There just hasn't been enough time or money to build up adequate information on dosages and methods most likely to prevent or minimize damage. This dilemma cannot properly be blamed upon pest-ridden farmers or upon other customers. Nor should manufacturers be criticized for meeting the popular demand. In fact, it doesn't help to blame anyone. The important thing is to expedite as much as possible the production of new knowledge for effective use of the new tools. Right now, we are in a difficult transition period in which techniques of use are trying to catch up with runaway operational programs. Until this gap is closed, some avoidable harm to wildlife will remain unavoidable.

There is one important break for which we can be thankful. Without it, the situation would be much worse. This favorable factor is the unexpected degree of interest and cooperation given by the public. Private individuals using control chemicals, as well as civic, State, or Federal organizations, and the manufacturers themselves, have shown regard for the wildlife side of the problem.

This is something new. How different from the attitude displayed less than two decades ago when the Atlantic Coast marshlands were being drained at public expense by relief agencies. Agencies indifferent or antagonistic at that time are now solicitous for wildlife values and have given a helping hand to the cause. Fish and Wildlife Service investigators studying effects of insecticides have received valuable cooperation from many sources. Without such assistance, the limited staff and funds available for investigations would have accomplished much less, and information developed to date would necessarily be considerably more limited than it is.

New Wildlife Hazard

Insecticides and herbicides are by far the most important new hazards recently introduced into wildlife habitat. DDT is the most important insecticide in current use. Millions of acres of farmlands, forests, and marshes have been sprayed in the past few years. How is this potent poison affecting wildlife? What is it doing to waterfowl? Upland gamebirds? Songbirds? Fish? Other animals? How seriously does it reduce food supplies for some kinds of wildlife? Is an animal likely to be affected if it eats organisms killed by poison? Are there likely to be cumulative effects from repeated DDT sprayings? What dosages or formulations can be applied with safety to wildlife and yet give effective control of pest insects? These are a few of the questions tackled by the series of studies the Fish and Wildlife Service started in 1945. Some of the answers are now known and reported, in part at least, but much still remains to be learned. There must be anticipation of DDT's harmful potentialities so that they can be avoided.

The vulnerability of various animals to DDT has been determined preliminarily. It has become evident that under certain conditions this insecticide can be poisonous to many forms of life besides insects. Susceptibility depends upon the kind of animal as well as upon the strength of dosage, formulation, time and conditions under which used, and several other factors. As is generally recognized, most insects are readily killed. So are crustaceans such as crayfish, crabs, shrimps, and others — some of which are valuable as food for ducks and men. Fish, especially small ones, are also fairly sensitive, and so are frogs, toads, snakes and their relatives. Birds usually are not poisoned by light dosages such as are used in most mosquito-control operation. However, at 2 pounds per acre, nesting populations of some insect-eating birds decrease—apparently because their food supplies become low. When more than 2 pounds of DDT per acre is applied, birds die. Generally, the mortalities become fairly heavy at five pounds or over. Fur and game animals are not readily poisoned by DDT at strengths used in insecticidal programs.

Destroys Bird Food

In coastal waterfowl habitat, spraying with DDT at dosages normally used in mosquito-control programs has not been found directly harmful to the birds. But, it is very destructive to organisms commonly eaten by some ducks and rails. Just how important this may be is difficult to say, since incoming tides bring renewed populations of crustaceans as well as killifish. However, reduced populations of some insects other than mosquitoes are still noticeable in the following year. This fact may involve significant reduction of important food—particularly for nesting birds.

Spraying of woodland areas with dosages such as 2 pounds per acre creates a temporary shortage of food for insect-feeding birds, and often results in departure of some pairs to some other territory. However, those that remain in the sprayed area generally rear their young with little or no evident harm from this concentration of DDT. Young birds are more susceptible to the poison than adults, but DDT sprayed on eggs does not appear harmful. In general, it is desirable to avoid spraying at the height of the breeding and nesting period in order to sidestep excessive losses. As to cumulative effect from repeated dosages, the evidence at present is largely negative. A 117-acre forested tract at the Patuxent Research Refuge, sprayed experimentally with 2 pounds of DDT per acre for five years, has shown no appreciable increase in harmful effects.

With these varying degrees of susceptibility, and with various dosages of DDT being applied in different places, the over-all picture of effects upon wildlife is naturally a complex one. Much harm is wrought by some spraying operations, and little or none by some others. A heartening aspect is the tendency by considerate operators to reduce dosages or to adjust spray formulations, or even to shift the time of application, if changes such as these benefit wildlife without seriously reducing effectiveness of insect-control programs. Instances of serious damage to wildlife may be further minimized as information increases on total effects to be expected from DDT applied in different dosages and under different circumstances.

Proper Use Mandatory

In some respects the picture for DDT looks less ominous than it did at the time the poison was first released to the public in 1945. We have learned a good deal about where, when, and how the compound may be used without seriously jeopardizing wildlife values, and a large segment of the public is handling its bug problems within limits known to be reasonably safe for wildlife. However, human nature being what it is, there are frequent departures from acceptable procedures in insect control. The philisophy "if a little is good, more should be better," appears too commonly to the detriment of wild forms. And at other times, rank carelessness in the use of such poisons has been found the cause of notable losses. Accordingly, the job of safeguarding wildlife involves not only a program of fact finding to guide insect control, but an immense educational program to instill "know-how" and responsibility into those conducting operations.

About 75 million pounds of DDT

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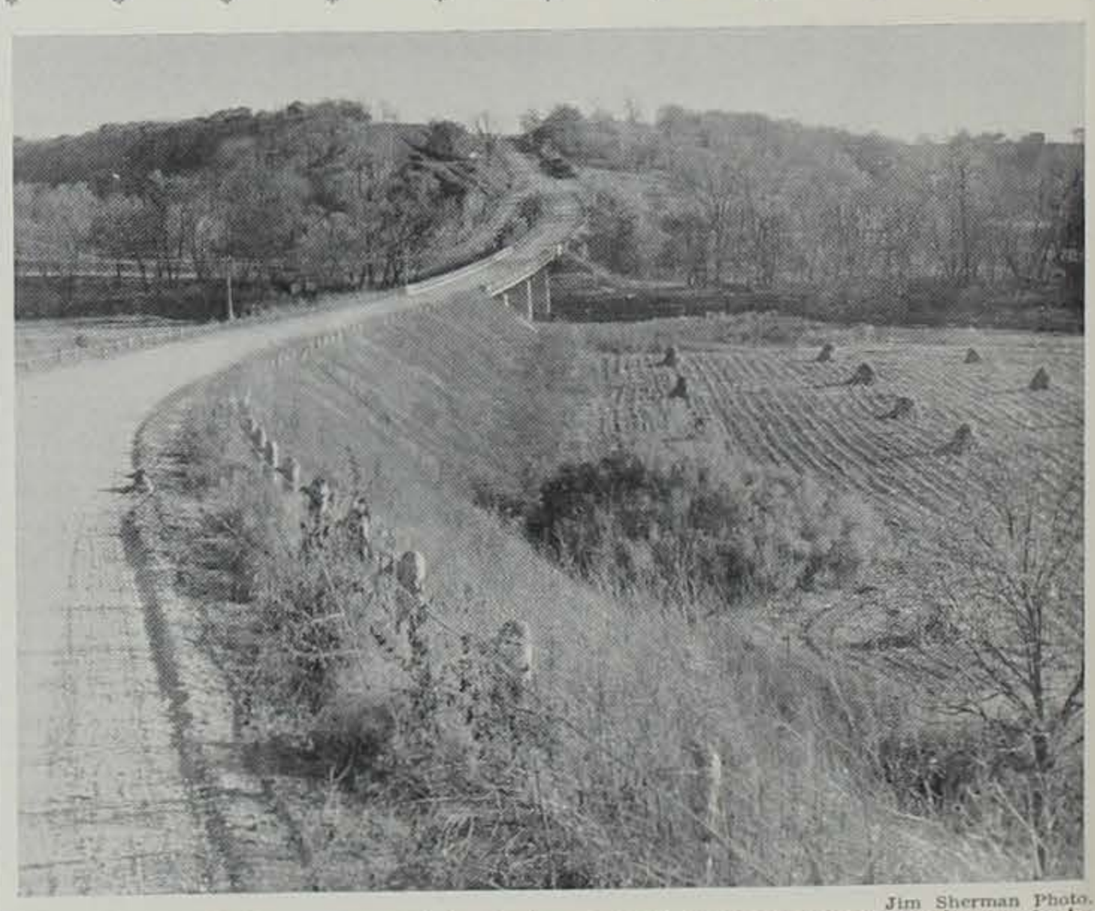


Jim Sherman Photo.

Some of the herbicide sprays used to destroy growth along our roads are known to be damaging directly to wildlife. The resulting destruction of essential food and cover may be indirectly far more devastating.

Chemical Controls . . .

(Continued from page 54)

are sprayed or dusted each year on millions of acres of American fields, forests, and marshes. Nearly an equal amount of another insecticide, toxaphane, is used, and approximately 30 million pounds each of lead arsenate and calcium arsenate are applied annually. Some of these chemicals do not represent nearly as much of a threat to wildlife as does DDT, but new rivals for this miracle bug-killer are appearing almost daily. There is a seemingly endless parade of new poisons, some of which are more hazardous than DDT. Aldrin, for example, is one of the potent newcomers. Seven million pounds of it were used this past year. Dealdrin, parathion, chlordane, methoxycholor, and other unpronounceable new and powerful poisons have appeared on the scene recently. The big problem is to learn enough about them before widespread use results in needless damage. Little is known of their effects upon wildlife, and the prospects for even a minimum testing are not good. In this unequal race against time, the chemists are setting too fast a pace for the limited staff of wildlife investigators. In view of the fact that there is slim likelihood of a slowdown in production of new chemicals, there is urgent need of an expanded program of preliminary testing of their effects. Experience has demonstrated that when wildlife biologists work with entomologists in checking dosages, formulations, and other factors in the use of new insecticides, procedures usually can be worked out reasonably satisfactorily to safeguard desirable wildlife and game without appreciably impairing the effectiveness of control. Serious consequences nearly always result when this is not done.

Deadly to Fish

Examples of serious wildlife and fishery losses are already being reported. Last summer fish were killed down a stream as much as two miles from an orchard where a potent spray had been used and where a tank containing the spray had been washed out. Even in great dilutions that reach astronomical figures, the toxicant is so lethal that it kills fish.

Another equally serious angle on pest-control chemicals is in the use of herbicides. Probably more than 100 million acres in the United States were sprayed with 2,4-D this past year, using 25 to 30 million pounds of the chemical. In addition, there is an increasing use of herbicides such as 2,4,5-T and Ammate for woody plants, and TCA for grasses. What are these and similar chemicals doing to the wildlife picture? It's impossible to give a reliable, over-all picture at this time. Doubtless both harm and some good are resulting to wildlife. Maintaining open avenues dominated by herbaceous growths along fire lanes and power lines, through the use of chemicals, may, in the long run, be advantageous to numerous kinds of wildlife. Herbicides may be used to open up thousands of acres of unproductive marsh clogged with pest plants—provided we know enough about their use in particular plants under a particular set of conditions. On the other hand, roadside and fencerow control of shrubs and weeds, particularly if accomplished during the breeding season and especially in agriculture areas of insufficient cover, may cause much mortality to game birds and animals, and many other species. There is much that needs to be learned about the direct and indirect effects of herbicide sprayings, especially upon wildlife food and cover resources.

Some of the poisons are known to be damaging directly to wildlife, and the resulting destruction of essential cover and food may indirectly be far more devastating. The removal of essential fencerow, ditch bank, or driveway cover may eliminate game from the only available cover in much of our agricultural areas. The removal of such a high per cent of habitat for most insectivorous birds may have far reaching and long continued effects. The seriousness, complexity, and enormity of the problem is scarcely recognized either on a Federal or a State basis, and the situation bids fair to grow worse. Considering the staggering amounts of funds going into the development of the new herbicides, insecticides and other pesticides, it would seem that a fraction of this should be diverted for a biological assaying of hazards to men and beast. We are viewing the problem through a peephole. A broader perspective is urgent, and may it come before it is too late! —*"Ducks Unlimited Quarterly," Spring, 1952.*

OWL ATTACKS FARMER

An owl may have cost a man the sight of one eye. Charles Hach was working on machinery in his farmyard north of Green Mountain when an owl flew out of its nest in a windbreak 150 yards away and attacked him. The owl first pecked Hach on the back of the head, then when he turned around, gouged him in the eye.

Hach was hospitalized in Evangelical Deaconess Hospital in Marshalltown and was operated on. He was reported getting along all right, but whether or not the eye could be saved was not known.

Members of the family theorized that the owl might have young birds in the nest it was trying to protect. Mrs. Hach reported that the owl has always been mean and has bothered her on several occasions when she went near its nest. However, no one could explain why the owl flew such a distance to attack Hach.—*Marshalltown Times Republican.*

Louis Dehner suggests that a worthwhile project for the Burlington Kiwanis Club to undertake is to see that conservation is taught in city and rural schools alike. Here a group of schoolteachers are studying the ecology of a marsh.

KIWANIS IN CONSERVATION PROGRAM

We note with considerable satisfaction the action taken by the agricultural committee of the Burlington Kiwanis Club in supporting conservation of natural resources and pledging assistance in the carrying out of a program in Des Moines County.

Having been rather interested in conservation for quite some period of time, and in so doing accumulating some rather startling facts, we feel that probably the voices crying in the wilderness are being heard at long last.

Too many people are apt to think of we conservationists as being interested only in fish and wildlife. Nothing can be further from the real tenets of a true conservationist. That is only part of the creed. Land, water and other natural resources are just as much a part of our principles.

Surely by this time we have learned that the monumental dams built by the U. S. Engineers are not the answer to flood control. Yes, friends, they can put on a wonderful song and dance and seemingly convince some of our best thinking men and women that their program is the panacea of all our evils; they have done a right good job right in our own town and country and most of these self-same men and women are always kicking about their taxes. Why, the money these engineers have spent and are spending right along in a fruitless cause isn't stopped by our congressmen is not understandable unless it is because their constituents do not protest.

We are going to suggest that the first worth-while project for the Burlington Kiwanis Club to undertake in their program to aid and assist conservation in Des Moines County is to see to it that conservation is taught in our city and rural schools alike. This may prove to be an obstacle rather hard to overcome but if you Kiwanians are sincere and really want to help, you will let no one dissuade you from teaching our boys and girls the tenets of conservation so that they may be inculcated with the truths to keep our country the leading nation of the world.—*The Game Bag, by Louis J. Denner, Burlington Hawkeye Gazette.*

A PERSONALITY KID

We have in our yard a classic example of the power of personality—mind over matter, as it were.

We bought a mallard duck to be used in training the dogs. We thought we would keep him a few weeks and then we would eat him. He was a very pretty duck and we clipped his wings so he couldn't fly away. He had a little house and a pen and one day we decided to let him out into the yard. He stayed in the yard and was very well behaved, didn't make any noise or dig up the shrubbery. When anyone turned on the hose he would come running to get his feathers wet. So we got him an old dishpan and we keep water in it for him and he sits in the pan dreaming, no doubt, of a marshy pond.

This duck that we intended to eat comes running up to us when we come outdoors and tries to strike up a conversation. He has learned our car and now he comes waddling and quacking up the driveway when we drive in.

So we never can eat our duck, whom we call George. We will all be very sorry when he dies of old age. His personality saved his neck.

There must be some sort of moral in this tale of a duck. If someone is out to "get" you just turn on the old charm. You may reverse a decision.—*Eldora Herald Ledger.*

A Dissertation . . .

(Continued from page 49)

Nightcrawlers are expert at their work of loosening and fertilizing the soil. Their diet is simple enough; they just eat their way through soil rich in humus, returning to the surface at night to deposit their excrement, or "cast-

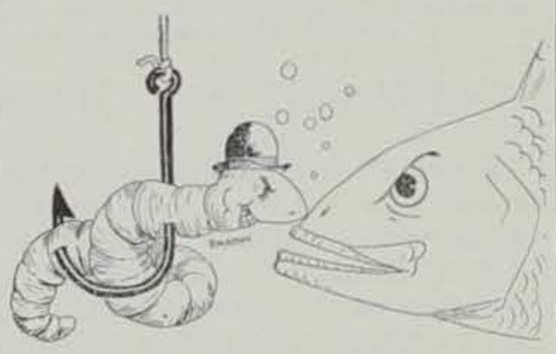
ings." These castings are nothing more than digested soil, tremendously enriched. The available nitrogen, potash and phosphorous may be six times that in the top six inches of the soil. Such castings may amount to as much as twenty-five tons a year on an acre of fertile soil. It is this slow, relentless cultivation that causes old boulders and buildings to sink. In reality they are being buried. Huge glacial boulders have been completely buried by this action, and the mosaic tilings of many Roman baths owe their preservation to the lowly worm.

Physically, the nightcrawler is a long tube of muscle, equipped

with very simple nervous, circulatory and digestive systems. It is completely deaf, nearly blind, and has only a feeble sense of smell. If they can keep away from birds and catfishermen, nightcrawlers may live ten years, producing young from the time they are three months old.

Their mating is an interesting process, and is about what might be expected from an animal with a pinpoint brain. Each nightcrawler is hermaphroditic, or bisexual. There are no distinct males and females. But, while each worm has both male and female reproductive cells, it is incapable of self-fertilization. It is necessary for each nightcrawler to obtain the male cells of another to fertilize its own eggs. This is done at night on the surface of the earth.

Well, now that you have grabbed two nightcrawlers at once, let's take a look at them. Notice that girdle or band around the nightcrawler's body. That's the clitella which is slowly slipped forward, receiving eggs and sperm from small openings in the sides of the body. It eventually slips over the



head, closes at both ends, and is deposited in the soil. About the size of a small pea, this capsule contains three to six worms which will hatch in twenty to thirty days.

There are several angles to the old question of early birds, worms, and how they get together. One idea is that the worms make slight clicking sounds which birds can hear. Another is that the birds can hear them moving through the soil. Actually, it would take a very early bird to hear a nightcrawler in transit. The listening attitude assumed by hungry robins is not what it seems. Since most birds do not possess that happy binocular vision of man, it is necessary for them to tilt their heads to the side to see what is going on in the grassroots. So, the robin is actually watching, and not listening, for the nightcrawlers.

When hidden in his deep, narrow burrow, the nightcrawler or angleworm is safe from most birds. This problem was solved with the invention of the woodcock. It is said that the woodcock may do a sort of tap dance on the ground. The angleworms, hearing the patter on the ground litter and naively believing it is raining or something, come up.

And, finally, the earthworms are admirably adapted for fishing. They are so well adapted, in fact, that some states have set aside areas in which their use in catching trout is prohibited. The use of "garden hackles" makes most fishing purists very unhappy, and for good reason. Angleworms are usually a deadly trout bait. Old trout, wise in the lore of dry flies and barbless hooks, cannot resist nightcrawlers. We will not discuss the ethics involved in using such live baits, but suffice it to say that the reaction of an earthworm in a trout stream is often explosive. As bait for channel catfish in the spring, nightcrawlers are unexcelled, and in midsummer large gobs of them are very effective on flatheads.

We might go into windy and heavy detail on somatic expansion and contraction, sub and supra esophageal ganglii, and setal functions. Or, we can forget about such things, take the nightcrawler at his face value, and go fishing tonight. Let's!

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Herb Swartz Photo.

There are numerous species of angleworms in this country. Our largest is the common nightcrawler which may reach twelve inches or more in length.

Development . . .

(Continued from page 53)

cation phase. The three groups and the three phases of soil conservation are so closely inter-related that a fine line cannot be drawn between them. The work of the three agencies, other groups and individuals must be coordinated in order to see that all horses are pulling in the same direction.

Most everyone will admit that a lot of soil conservation practices have been applied to the land the last 10 or 12 years but the program must be speeded up if we are to remain at the top in agricultural production for years to come. The importance of this program is expressed in the soil conservation objective as issued over a year ago by Charles F. Brannan, Secretary of the United States Department of Agriculture, as follows: "The basic physical objective of soil conservation activities by Department agencies shall be the use of each acre of agricultural land within its capabilities and the treatment of each acre of agricultural land in accordance with its needs for protection and improvement." This USDA objective as stated by Brannan has long been the one sought by the local soil district and its cooperators. In most cases the degree of success obtained by the soil districts is reflected in the interest and leadership and initiative shown by the local District commissioners and their helpers. By their helpers, we mean the many people assisting the District, and especially the Soil Conservation Service and Extension Service personnel. It would be almost impossible to make a list showing all the groups and individuals assisting the Districts.

The Herald-Patriot believes that we should at this time pay tribute to the local farmers who helped organize and operate the local Districts. In most cases this group would include the hard working, unpaid, unrecognized District Commissioners. These men serve the community and you—yes, each of you— in a capacity that is becoming more important each day as we think of the future. With the population of our country increasing rapidly and world conditions as they are, we must continue to produce food and agricultural products in large quantities and we must conserve our soil in order to increase production.

Let's all think and do something about conservation this week—and every week from now on.—*Charlton Herald Patriot.*

BLACK HAWK LICENSES UP IN 1952

A sharp increase in the number of fishing licenses issued in Black Hawk County was revealed yesterday by figures related by Miss Pearl Roberts, Black Hawk County recorder.

The total number of fishing, hunting, combination and nonresident licenses sold from April 1, when 1952 licenses were placed on sale, to June 7, are shown in the following table which also gives the total number sold during the same period in 1951.

	1951		1952	
	Number	Fees	Number	Fees
Fishing ...	2,804	$4,206	3,756	$5,634.00
Hunting ..	28	42	12	18.00
Comb.	3,037	7,592	3,398	8,495.00
Non-Res. Fishing	13	38	6	17.50
	5,882	$11,878	7,172	$14,164.50

These figures arouse an interesting line of speculation. Assume each one of the more than 7,000 licensed anglers in the county spends an average of $25 on equipment, a figure that is probably far too low, and you have county residents spending, including cost of licenses, nearly $200,000 on the sport.

These figures, of course, do not include such incidental expenditures as transportation to and from fishing spots, cost of live bait purchased, etc.

And county residents probably spend even more on fishing trips to neighboring states and Canada. Looks like fishing is truly big business.—*By Bill Severin, Waterloo Courier.*

With the exception of the marvelously compound eyes of insects, those of birds are probably the world's most perfect optical instruments. B.C.